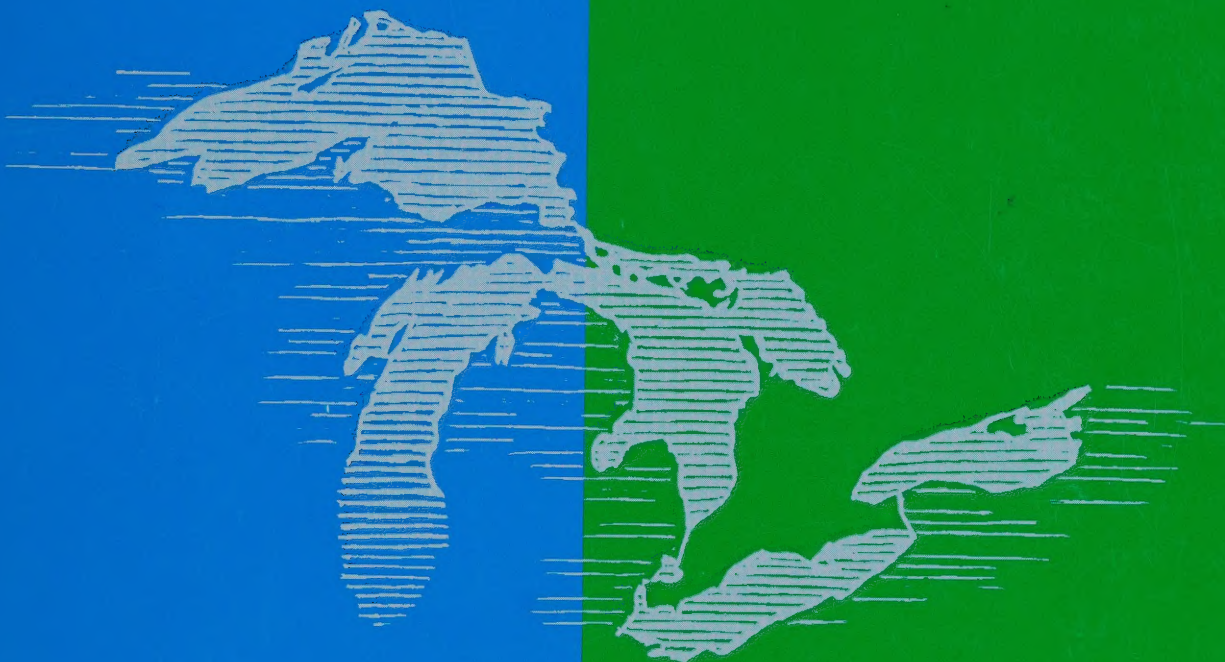


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**Second Report of Progress
Under the
Canada-Ontario Agreement
Respecting the
Great Lakes Basin Ecosystem
1995 - 1997**



PARTNERSHIPS

for the Great Lakes

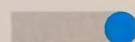


This document, as well as an Annex entitled Detailed Report on Activities and Results, 1995-1997, are available on Environment Canada's Great Lakes Information Management Resource (GLIMR) which operates within the World Wide Web and can be located under the Uniform Resource Locator (URL) "<http://www.cciw.ca/glimr/intro.html>".

GLIMR contains an index of programs, publications, and databases on the Great Lakes and can be used to access Environment Canada's national Green Lane Network as well as additional environmental networks that operate within the Great Lakes basin.

CONTENTS

OVERVIEW	1
THE CANADIAN APPROACH	1
MEETING OUR COMMITMENTS	2
SUMMARY OF PROGRESS 1995 - 1997	3
OBJECTIVE 1: RESTORE DEGRADED AREAS	3
1.1 Remedial Action Plans	4
1.2 Capital Works	4
1.3 Species and Habitat Rehabilitation	5
1.4 Contaminated Sites	6
1.5 Contaminated Sediments	6
1.6 Groundwater	6
1.7 Human Health	7
OBJECTIVE 2: PREVENT AND CONTROL POLLUTION	7
2.1 Priority Toxic Substances	8
2.2 PCBs, Hazardous Waste and Spill Reductions	9
2.3 Binational Initiatives	10
2.4 Atmospheric Deposition	10
2.5 Pesticides	11
OBJECTIVE 3: CONSERVE AND PROTECT	
HUMAN AND ECOSYSTEM HEALTH	11
3.1 Lakewide Planning	12
3.2 Habitat Conservation and Protected Areas	12
3.3 Fish and Wildlife Conservation	12
3.4 Human Health	13
3.5 Climate Change	13
3.6 Land and Water Use Management	13
APPENDIX I	15
SELECTED PUBLICATIONS ON GREAT LAKES ACTIVITIES	15



OVERVIEW

This is the Second Progress Report since the **Canada-Ontario Agreement (COA) Respecting the Great Lakes Basin Ecosystem** was signed in July 1994. It summarizes the progress that has been made by federal and provincial government agencies and their partners in meeting the COA targets. The document focuses on the implementation of activities and the results that have been achieved since the publication of the First Progress Report in September 1995.

1997 marks the twenty-fifth anniversary of the signing of the Canada - U.S. Great Lakes Water Quality Agreement (GLWQA). The Agreement has been instrumental in successfully addressing water quality problems in the Great Lakes basin. It has underscored the importance of binational cooperation in achieving common goals and the valuable contribution of the International Joint Commission (IJC) in reviewing and evaluating progress. Within Canada, it is the COA which provides the framework for systematic and strategic coordination of shared federal and provincial responsibilities for ecosystem management in the Great Lakes basin, and of Canadian efforts to fulfill Canada's obligations under the GLWQA.

This report, therefore, serves as the means by which Canada informs the IJC of the scope and progress of Canadian efforts to meet its commitments under the GLWQA.

THE CANADIAN APPROACH

The 1994 COA set out a plan of action that established priorities, targets and schedules for environmental issues of concern in the basin, as well as Canada's commitments under the GLWQA. COA established a results-oriented approach that identified more than 50 targets to be achieved during the six-year term of the Agreement. These targets address three main objectives:

OBJECTIVE 1:

● Restore Degraded Areas

Develop initiatives to continue the restoration of degraded areas throughout the Great Lakes basin, with emphasis on priority activities under the Remedial Action Plan (RAP) program to restore 60 per cent of impaired beneficial uses in Canada's 17 designated Areas of Concern (AOCs).

OBJECTIVE 2:

● Prevent and Control Pollution

Work with producers and sources of pollutants to establish schedules and to achieve significant interim reductions (90 per cent by 2000) in the releases of persistent, bioaccumulative and toxic substances.

OBJECTIVE 3:

● Conserve and Protect Human and Ecosystem Health

Promote health, reduce the risks of human exposure to environmental contaminants, and conserve and protect habitat and fish and wildlife communities.

MEETING OUR COMMITMENTS

Canada and Ontario are pleased to report that three key commitments of the 1994 COA have been achieved:

- A comprehensive audit of commercial pesticides use in Ontario confirmed that there is no sale, commercial use or importation of five priority substances taking place. This confirms zero discharge of these pesticides from commercial sources on the Canadian side of the basin.
- The Great Lakes Binational Toxics Strategy has been signed by Canada and the U.S. in an effort to virtually eliminate persistent toxic and bioaccumulative substances from the Great Lakes. The signing of this Strategy is a milestone towards restoring and protecting the Great Lakes.
- The Canadian Council of Ministers of the Environment formally approved the *Canadian Biodiversity Strategy: Canada's Response to the Convention on Biological Diversity*. This strategy fulfills the COA target aimed at developing biodiversity policies to protect the function and structure of diverse, self-sustaining biological communities.

A number of other important accomplishments should be highlighted. These include:

- More than 50 per cent of the remedial actions needed to restore AOCs have been implemented.
- The Severn Sound Environmental Association has been established by seven municipalities, Friends of the Wye Marsh, Environment Canada (EC) and the Ontario Ministry of Environment and Energy (MOEE). This innovative collaborative arrangement ensures the continued implementation and coordination of the Severn Sound RAP.
- A four-party agreement is being finalized among EC, MOEE, Waterfront Regeneration Trust and the Metro Toronto and Region Conservation Authority to forge a new implementation framework for the Metro Toronto and Region RAP.

- Over 3 000 hectares of wetlands and approximately half a million hectares of park land have been protected.
- Over 2 000 hectares of wetlands and almost 500 kilometres of riparian habitat have been rehabilitated.
- Forty-six per cent of the high-level polychlorinated biphenyls (PCBs) in Ontario have been decommissioned and almost 30 per cent of the high-level PCBs in storage have been destroyed.
- Stage 1 of the multi-phased, multi-year rehabilitation plan for the Deloro Mine Site commenced in April 1997. The work builds on MOEE efforts to contain and manage contamination at the site. The work planned for Stage 2 will further protect public health and safety and is part of the Ministry's environmental commitment to the Bay of Quinte RAP.
- New technologies for improving the quality of municipal sewage treatment effluent and for controlling urban stormwater runoff have been developed and are being implemented across many AOCs. These innovative technologies make it possible for municipalities to meet RAP effluent targets while saving millions of dollars in capital expenditures.
- New cost-effective technologies for the removal and treatment of contaminated sediments have been successfully demonstrated and are being used for full-scale clean-up projects in AOCs.
- Progress on the Thunder Bay RAP has moved forward significantly, with the recent launch of a project to clean up contaminated sediment at Northern Wood. This \$9.3 million project is jointly sponsored by Abitibi-Consolidated Inc., Canadian National Railway Company, Northern Wood (\$1.5 million each), MOEE (\$1.5 million) and EC (\$3.3 million).

SUMMARY OF PROGRESS 1995 - 1997

- Nearly 400 stakeholders that represent all levels of government, Conservation Authorities, private businesses and industry, environmental and community groups and associations have provided \$100 million in financial and in-kind services toward 240 projects supported by both governments.

This report presents a two-year snapshot of work in progress to enhance and sustain the Great Lakes. As is the trend with all Great Lakes basin agencies, environmental return on dollars spent is becoming more important as limited resources experience increasing pressures. Since the 1994 signing of COA, agencies have had to refocus efforts in the Great Lakes on those actions which will result in the largest direct improvement and build on partnerships with responsible parties and interested stakeholders. For example, both EC and MOEE have entered into partnerships with industry to clean up contaminated sediment in AOCs. This type of focused activity on the key priorities will allow both the provincial and federal governments to continue their dedication to enhancing the Great Lakes up to and beyond the year 2000.

Recognizing the importance of partnerships in the achievement of COA objectives and targets, Canada and Ontario would like to acknowledge the extensive actions undertaken by organizations and individuals which contribute to the rehabilitation, conservation and protection of the Great Lakes. It is clear that governments cannot clean up the Great Lakes on their own. The successful delivery of commitments under the COA requires continued action by all sectors of society.

OBJECTIVE 1: RESTORE DEGRADED AREAS

The focus of Objective 1 is to restore degraded ecosystems throughout the Great Lakes basin, with an emphasis placed on AOCs.

The IJC has identified 43 AOCs where the aquatic environment has been most severely affected. Seventeen AOCs are within Canada; of these, five are located on boundary rivers shared with the United States. The remaining 26 are entirely within U.S. jurisdiction.

In Canada, with the delisting of one AOC, RAPs are being developed and implemented for the remaining 16 AOCs. The approach to remediating AOCs involves significant public consultation and community involvement. A multi-stakeholder process is used to identify use impairments, select remediation options and design implementation strategies.

The lead federal and provincial agencies for RAPs are EC and the MOEE respectively. In cooperation with other government agencies, they supply important scientific and technical information upon which decisions are based, as well as coordinate the RAP process.

Achieving multi-stakeholder consensus is the foundation of community-based planning. This process has resulted in a number of important accomplishments. Progress is being made in restoring degraded areas and is supported by targets that are specific to capital works, species and habitat rehabilitation, contaminated sediment and landfill site remediation, groundwater and human health.

1.1 REMEDIAL ACTION PLANS

COA Target 1.1.1: Restore 60 per cent of impaired beneficial uses across all 17 Areas of Concern (AOCs), leading to the delisting of nine AOCs by the year 2000.

Approximately 13 per cent of the beneficial uses impaired by local sources have now been fully restored. Many more have shown signs of incremental improvements and one AOC, Collingwood Harbour, has been declared fully restored and delisted. More than 50 per cent of the necessary actions to restore the AOCs have been implemented.

COA Target 1.1.2: Complete and submit all RAP Stage 2 reports to governments by the end of 1996. The governments will respond to all completed Stage 2 reports and submit them to the IJC by the end of 1997.

Nine RAP Stage 2 reports have been submitted to governments. The governments have formally responded to eight of these reports. Two complete Stage 2 reports (Collingwood Harbour and Hamilton Harbour) have been submitted to the IJC. Work towards completion of all remaining RAP Stage 2 reports continues in all AOCs, except Port Hope Harbour where a separate process is being followed due to the nature of the contamination at that site.

Progress on this target is behind the schedule referenced in the target statement.

COA Target 1.1.3: Establish organizational frameworks for individual AOCs to coordinate and facilitate implementation of local RAPs upon completion of Stage 2 reports.

Sustain public involvement and advisory programs for the implementation phase of RAPs.

Implementation frameworks have been developed for seven AOCs. Progress on this target is behind the schedule referenced in the target statement.

As the RAP process has shifted its emphasis from planning to implementation, governments and stakeholders recognized the need to broaden support for continued public involvement. Canada and Ontario have therefore amended the COA RAP Public Involvement Guidelines to encourage greater self-sufficiency.

COA Target 1.1.4: By 1995, establish cooperative mechanisms, including environmental surveillance and monitoring, to track progress toward delisting all 17 AOCs.

EC and MOEE have developed a plan to monitor AOCs and the nearshore zone of the Great Lakes to the year 2002.

1.2 CAPITAL WORKS

COA Target 1.2.1: Upgrade eight RAP primary sewage treatment plants (STPs) to secondary treatment and optimize effluent quality and sludge generation at a further 12 plants in AOCs.

Progress towards upgrading STPs is well under way. One plant has been fully constructed, work on five others is at various stages of development, and two plants have been identified for upgrading. Seven STPs have been optimized for effluent quality in four AOCs (Severn Sound, St. Clair River, Bay of Quinte and Detroit River). Projects at 12 additional plants in five AOCs (Severn Sound, Hamilton Harbour, Niagara River, Metro Toronto and Region, and Bay of Quinte) are under way to optimize effluent quality and sludge generation.

COA Target 1.2.2: Enhance phosphorus removal at 15 STPs in AOCs by modifying or adding to existing phosphorus controls.

This COA target is nearing completion. Ten STPs in three AOCs (Collingwood Harbour, Severn Sound and Bay of Quinte) have achieved RAP phosphorus objectives either through optimization or capital works improvements. Projects at three other plants in two AOCs (Severn Sound and Bay of Quinte) are under way to enhance phosphorus removal.

COA Target 1.2.3: Undertake 25 stormwater quality pilot projects in AOCs.

Sixteen stormwater quality projects have been initiated in five AOCs (Spanish Harbour, Metro Toronto and Region, St. Lawrence River, St. Clair River and Severn Sound). Application of stormwater treatment technologies have the potential to save \$12 million per year in infrastructure costs for Canadian AOCs.

COA Target 1.2.4: Abate 40 per cent of combined sewer overflows in AOCs by implementing municipal Pollution Control Plans.

Pollution Prevention and Control Plans have been completed for seven AOCs (Thunder Bay, St. Clair River, Detroit River, Niagara River, Hamilton Harbour, Metropolitan Toronto and Region, and St. Lawrence River).

COA Target 1.2.5: Demonstrate and implement new and innovative technologies directly contributing to the restoration of beneficial uses through green industry strategies and other programs of both governments.

Many projects are either under way or proposed to demonstrate and implement new and innovative low-cost remediation technologies which have potential for significant capital expenditure savings. These technologies support attainment of COA targets related to habitat rehabilitation, capital works, contaminated sediment and groundwater.

1.3 SPECIES AND HABITAT REHABILITATION

COA Target 1.3.1: Rehabilitate ecosystem function and structure of diverse self-sustaining native biological communities in 12 AOCs and other priority degraded areas.

COA partners along with other agencies and the private sector have increased the number of habitat related projects in AOCs and other priority areas, and are facilitating rehabilitation activities basin-wide. Strategies, databases and techniques are being developed and disseminated to guide and support activities at the community level.

COA Target 1.3.2: Develop and implement recovery plans for six threatened species.

Recovery plans have been completed for four species: Henslow's sparrow, loggerhead shrike, peregrine falcon and eastern spiny softshell turtle. A further eight are in progress.

COA Target 1.3.3: Develop fish and wildlife goals and objectives for each of the Great Lakes and implement plans to rehabilitate degraded native populations.

Fish community goals and objectives have been developed for Lakes Erie, Superior and Huron as required by the Strategic Great Lakes Fisheries Management Plan. Those for Lake Ontario are under development.

COA Target 1.3.4: Increase the extent of productive aquatic habitats by rehabilitating and protecting 6 000 hectares of wetland habitat and 600 kilometres of riparian habitats.

The rehabilitation of more than 2 000 hectares of wetland has been completed. Rehabilitation of an additional 1 428 hectares is under way. Almost 500 kilometres of riparian habitat have been rehabilitated and projects involving an additional 178 kilometres are in progress.

1.4 CONTAMINATED SITES

COA Target 1.4.1: Remediate contamination at ten priority federally-owned sites, at five orphan sites under the National Contaminated Sites Remediation Program, and an expected 20 sites under provincial jurisdiction.

FEDERALLY OWNED SITES

Amendments to the *Auditor General Act*, which were introduced in December 1995, provide the impetus for federal departments to deal with their contaminated sites. The amendment requires each department to produce a Sustainable Development Strategy, one component of which is an Environmental Management System (EMS). Under the EMS, departments are required to identify and address land management practices, including the management and remediation of contaminated sites.

ORPHAN SITES

Site remediation work continued at five orphan sites (Chemical Waste Management Ltd., Smithville; Tyre King Fire Site, Hagersville; National Hard Chrome Site, North York; Deloro Mine Site, Deloro; and, Shamrock Chemicals, Port Stanley). The Hagersville cleanup is now complete.

PROVINCIAL SITES

Following further examination of the 20 sites, MOEE determined that only 13 were contaminated. Six of the 13 sites have been cleaned up, four by MOEE and two by responsible parties.

COA Target 1.4.2: Assess and prioritize closed landfill sites under provincial jurisdiction for potential problems.

MOEE has a comprehensive inventory of all known closed disposal sites (more than 2 000). The 377 closed sites which were considered to have the greatest potential for adverse environmental effects were assessed. While no significant impacts have been identified, a number of sites continue to be monitored.

1.5 CONTAMINATED SEDIMENTS

COA Target 1.5.1: Describe effects, demonstrate and implement the clean up of severely contaminated sediments, with emphasis on contamination at priority sites in AOCs.

Sediment contamination has been characterized at seven priority sites in AOCs and a number of innovative technologies for remediating sediment contamination have been developed and demonstrated.

COA Target 1.5.2: Develop long-term strategies for remediation of areas of intermediate sediment contamination at ten locations by the year 2000.

A Decision Making Framework for the assessment of sites has been developed and is being tested. Sediment has been characterized in order to develop long-term remedial strategies at Nipigon Bay, Spanish Harbour, Severn Sound, Collingwood Harbour, St. Clair River, Wheatley Harbour, Niagara River, Hamilton Harbour, Metro Toronto and Region, and Bay of Quinte. Remediation plans have been developed for 19 locations within AOCs.

1.6 GROUNDWATER

COA Target 1.6.1: Undertake hydrogeological investigations and demonstrations of new approaches to remediate groundwater contamination at priority locations in the Great Lakes Basin Ecosystem.

The new provincial decommissioning guidelines are driving remedial activity with specific and rigorous clean-up requirements. The remediation of groundwater contamination at many of these sites has proven to be a very costly and often unsuccessful endeavour. The objective of the work conducted under this target is to develop and demonstrate new and more efficient techniques for the clean up of contaminated groundwater at contaminated sites. Field-testing of these new techniques is now being undertaken or has been completed at several sites throughout the Great Lakes basin.

1.7 HUMAN HEALTH

COA Target 1.7.1: By 2000, reduce the risk of exposure to specific environmental contaminants in six known risk populations by 50 per cent.

Health Canada has supported community risk and exposure assessments by publishing handbooks which provide guidance for assessing health and environment issues in Great Lakes communities. Groups at health risk through exposure to persistent pollutants from sport fish and wildlife consumption are being identified in five AOCs and the risks, perceptions and benefits of eating Great Lakes fish are being quantified. Research studies examining the effects of persistent pollutants on reproduction, endometriosis, breast cancer and neurobehaviour have been undertaken.

OBJECTIVE 2: PREVENT AND CONTROL POLLUTION

The targets set out under Objective 2 relate to prevention and control of pollution.

The proposed approach calls for a systematic and strategic focus on the sources of targeted substances. The intent is to develop and implement appropriate action plans for the reduction and elimination of those substances from each source where existing activities are insufficient to achieve COA targets. A number of tools are being applied that range from regulation to voluntary programs such as pollution prevention initiatives.

Progress towards COA objectives for toxic substances has been mixed. The expenditures by companies to decommission and destroy their polychlorinated biphenyl (PCB) inventories have begun to break a long-standing log-jam in eliminating this material from Ontario and the responsible companies should be commended. Despite short-term setbacks in the ability of Canadian owners to have access to U.S. destruction facilities, more options for PCB destruction exist today than when COA was signed, introducing competitiveness and hence cost effectiveness into the marketplace. The governments conducted an outreach program which was successful in bringing together 125 owners to seek options in managing their PCBs.

The response to the COA challenge for reductions in other Tier I and II substances has been weak. Many significant sources have failed to commit to reductions in the use and/or release of these substances. Those that have, and have publicly documented their commitment, are to be commended. Companies, municipalities and sources that have taken steps to address the COA targets but have not yet reported on these steps cannot be acknowledged for their contributions unless they publicly declare their intent or progress. Those sources that have not made any commitment to reductions, or have committed to process but not quantitative reductions, will be targeted for focused action in the coming years to determine what commitments can be made.

Assisting in meeting the COA pollution prevention and control targets is the Accelerated Reduction/Elimination of Toxics (ARET) initiative. The goal of ARET is the virtual elimination of 14 persistent, bioaccumulative and toxic substances (including Tier I and II substances) over the long term, and the reduction of 87 other hazardous toxic substances. Voluntary action on the part of some users and emitters of toxic substances has achieved some major Tier I substance reductions, but ARET is expected to have little further impact on reducing the quantity of Tier I substances released unless stakeholder participation increases significantly. Companies which are emitters of Tier I substances are strongly encouraged to consider their ability to reduce these emissions and document reductions in ARET so as to broaden participation in ARET beyond existing partners and reduction commitments. The federal and provincial governments will be approaching non-participants in an effort to determine the barriers to voluntary reductions, given the consistent message from industry that they should be allowed flexibility in achieving standards set out by the governments.

Also in March 1997, under the federal Toxic Substances Management Policy (TSMP), Canada proposed 13 candidate substances for virtual elimination, nationally. The scientific rationale that outlines how the candidate substances satisfy the criteria for TSMP Track 1 has been posted in the *Canada Gazette* for public comment and comments are being reviewed at present. Ten of these substances are COA Tier I and II substances (aldrin, dieldrin, dichloro-diphenyl-trichloroethane (DDT), toxaphene, chlordane, dioxins, furans, PCBs, mirex and hexachlorobenzene).

2.1 PRIORITY TOXIC SUBSTANCES

COA Target 2.1.1: For Tier I substances Canada and Ontario agree to seek a 90 per cent reduction in the use, generation or release of the remaining seven substances (benzo[a]pyrene, hexachlorobenzene, alkyl-lead, mercury, octachlorostyrene, PCDD [dioxins] and PCDF [furans]) by the year 2000.

Total releases of these seven substances are estimated to be 22 tonnes per year, dominated by releases of benzo(a)pyrene and mercury. Some reductions have occurred with respect to alkyl-lead (85 per cent), octochlorostyrene (18 per cent), dioxins and furans (66 per cent) and B(a)P (20 per cent), mainly under the ARET program.

COA Target 2.1.2: For Tier II substances and other pollutants, Canada and Ontario agree to collaborate with, and provide support for, voluntary programs by industry and others to reduce the use, release or generation of Tier II substances (cadmium, hexachlorocyclohexane, 1,4-dichlorobenzene, 3,3'-dichlorobenzidine, 4,4'-methylene bis(2-chloroaniline), pentachlorophenol, tributyl tin, and a group of PAHs including anthracene and dinitropyrene), and establish specific timelines and targets for achieving their virtual elimination.

Reductions have occurred in the release of four of the eight Tier II substances, primarily as a result of actions by ARET members: cadmium (20 per cent), 1,4-dichlorobenzene (40 per cent), PAHs (30 per cent) and pentachlorophenol (5 per cent).

COA Target 2.1.3: Provide essential knowledge on the fate and effects of Tier II substances from industrial, municipal and other sources.

EC is involved in over 25 research projects to provide knowledge on the occurrence, fate and effects of Tier II substances in the waters of the Great Lakes basin.

COA Target 2.1.4: For Tier I, Tier II and other polluting substances:

- a) *Work with industry to attain commitments to achieve the targets stated herein through such formal arrangements as Memoranda of Understanding (MOU), and through informal arrangements as appropriate.*
- b) *Implementation by 1998 of pollution prevention programs will be promoted and encouraged at targeted industrial facilities discharging to the Great Lakes, through a variety of instruments, including the Ontario Pollution Prevention Pledge Program (P⁴) and the national ARET initiative.*

Some success has been achieved in attaining industry commitments and implementation of pollution prevention programs. Reductions reported through MOUs include:

- 1 600 tonnes volatile organic compounds;
- 1 500 tonnes hydrocarbons;
- 660 tonnes wastewater treatment sludges;
- 450 tonnes metal working fluids; and,
- 330 tonnes paints/paint sludges.

Both the federal and provincial governments have established voluntary pollution prevention partnerships with industries, municipalities, government departments and others.

2.2 PCBs, HAZARDOUS WASTE AND SPILL REDUCTIONS

COA Target 2.2.1: Seek to decommission 90 per cent of high-level PCBs in Ontario, to destroy 50 per cent of the high level PCBs now in storage, and accelerate the destruction of stored low-level PCB waste by the year 2000.

Forty-six per cent of high level PCBs have been decommissioned. Thirty per cent of high level PCB wastes and 20 per cent of low level PCB wastes have been destroyed.

COA Target 2.2.2: Actions to address both Tier I and Tier II pollutants will include significant, measurable reductions in the generation and release of hazardous wastes from all sources, and will focus on cooperative activities with waste generators.

The total hazardous and liquid industrial waste quantities manifested in Ontario have increased by approximately 25 per cent to over 1.8 million tonnes from 1994 to 1996, based on Ontario's manifest tracking system. Increases in hazardous waste generation and subsequent safe and economic disposal of these wastes and/or their re-use/recycling likely reflect increased productivity in the economy of Ontario. However, the quantity of wastes disposed of to incinerators and out-of-province facilities that handle hazardous wastes has shown a decrease, which may be due to material reuse or recovery.

COA Target 2.2.3: Actions to address the prevention and control of spills by improving federal, provincial and industrial spill prevention, preparedness and response programs in priority areas such as the St. Clair River, will further reduce pollutant loadings.

Canada and Ontario continue to undertake actions to meet this target. In 1995, 329 spills occurred in the Great Lakes system. This represents a 14 per cent decrease from 1994.

2.3 BINATIONAL INITIATIVES

COA Target 2.3.1: *Establish with U.S. Federal and State governments, a common strategy by 1996 to eliminate the discharge of persistent, bioaccumulative and toxic substances to the entire Great Lakes Basin Ecosystem.*

This target has been achieved through the signing of the Great Lakes Binational Toxics Strategy. The importance of the Strategy is the clear definition of quantified goals and objectives for pollutant releases within the U.S. and to the Great Lakes basin, consistent with the COA approach.

COA Target 2.3.2: *Reduction targets will be pursued under the Niagara River Toxics Management Plan (NRTMP) and Lakewide Management Plans (LaMPs).*

Toxic reduction plans for major industrial sectors will be incorporated into LaMPs for Lakes Ontario and Superior by 2000.

The NRTMP has reported progress on the reduction of 18 toxic substances. The Stage 2 Lake Superior LaMP has identified load reduction schedules for nine substances. Reduction targets for Lake Erie will not be developed until the Stage 1 LaMP identifies pollutants of concern and a Stage 2 is developed. The toxic reduction plan for Lake Ontario incorporates commitments from the former Lake Ontario Toxics Management Plan. Additional reduction measures will be identified during the Stage 2 process.

COA Target 2.3.3: *The role of zero discharge in achieving the virtual elimination of persistent bioaccumulative and toxic substances will be demonstrated, bearing in mind social and economic factors, primarily through the Lake Superior Binational Program.*

In cooperation with the Lake Superior Binational Forum, the U.S. Environmental Protection Agency, and the States of Michigan, Wisconsin and Minnesota, an Economic Sustainability Analysis is being undertaken to strategically evaluate the economic implications of zero discharge. All the dioxin and furan

discharges to Lake Superior from Ontario kraft pulp and paper mills have been eliminated as a result of Ontario's MISA Pulp and Paper regulation and the federal regulation.

Two years of pollution prevention initiatives have produced several pilot projects and demonstrations. The zero discharge demonstration program is strategically targeting sectors of the economy that are receptive to pollution prevention. Awareness in the business and municipal sectors of the effectiveness of pollution prevention should result in further actions.

COA Target 2.3.4: *Jointly declare the waters of Lakes Superior and Nipigon under a designation such as the Canada Water Act (CWA) Part I, and investigate this mechanism for other exceptional waters.*

Discussions regarding the designation of Lakes Superior and Nipigon under the CWA are under way.

2.4 ATMOSPHERIC DEPOSITION

COA Target 2.4.1: *The identification of atmospheric inputs of toxic chemicals, and their impacts, derived from worldwide sources, will provide a basis for supporting international negotiations to reduce loadings in the Great Lakes Basin Ecosystem.*

A number of programs are being proposed and developed at the regional, national and international levels, as many pollutants are not restricted to a geographic area and so are of concern outside the country of origin. Canada's involvement in these endeavours is in part aimed at reducing loadings to the Great Lakes. Monitoring and surveillance data collected in support of COA is used to demonstrate the effects of long-range transport of pollutants.

COA Target 2.4.2: Improvements in and integration of existing air toxics data networks and management systems to track the deposition of contaminants within the Great Lakes Basin Ecosystem will support these international negotiations.

MOEE and EC continue to support the Integrated Atmospheric Deposition Network (IADN), developed under the GLWQA, which provides the basis for understanding the major sources to the Great Lakes of many COA Tier I and Tier II substances.

2.5 PESTICIDES

COA Target 2.5.1: For Tier I Substances, Canada and Ontario agree to confirm by 1996 that zero discharge has been achieved for five priority substances.

This target has been achieved. Based on a comprehensive review, zero use and availability within Ontario's commercial sectors of the five priority substances (aldrin/dieldrin, chlordane, DDT, toxaphene and mirex) have been confirmed.

COA Target 2.5.2: For Tier II substances and other pollutants, Canada and Ontario agree to a coordinated review and evaluation of registered and scheduled pesticides.

A multi-agency Pesticide Review Committee (PRC) has been established that includes all relevant agencies: Agriculture Canada, EC, Health Canada, Pest Management Regulatory Agency, MOEE, Ontario Ministry of Agriculture, Food and Rural Affairs, and Ministry of Natural Resources (MNR). A new business plan to address pesticides of concern in the Great Lakes Basin Ecosystem is being developed by the PRC to encompass the use of pesticide alternatives and a risk reduction approach to resolving documented environmental issues.

OBJECTIVE 3: CONSERVE AND PROTECT HUMAN AND ECOSYSTEM HEALTH

This objective focuses on a wide variety of programs which are developed and implemented to conserve human and ecosystem health. Assessing ecosystem health continues to be a priority. Species such as the herring gull, lake trout and smelt are used as bio-indicators of the levels of contaminants in the environment, and also serve as an early warning of possible effects in humans. Trying to understand human health effects from pollutants is difficult to ascertain directly, particularly since diet, lifestyle and socio-economic concerns all influence overall human health.

Progress on this objective can be measured according to the effectiveness of new and existing programs, the implementation of legal and policy measures and by measuring indicators. Scientific research into understanding ecosystem interactions and human health implications is important to conservation activities. Implementation of the Great Lakes Wetlands Conservation Action Plan, in conjunction with volunteer-based Wildlife Watchers Program, has contributed to wildlife conservation and builds on broad national programs such as the North American Waterfowl Management Plan and endangered species initiatives. Amendments to the *Ontario Conservation Lands Act* and the federal *Income Tax Act* provide incentives to landowners to conserve ecologically sensitive land. Indicators continue to be developed and measured for most targets.

3.1 LAKEWIDE PLANNING

COA Target 3.1.1: Develop ecosystem-based principles, objectives and indicators for Lake Ontario by 1995, Lake Superior by 1996, Lake Erie by 1996, and Lake Huron by 2000 to provide direction for management plans.

Develop Stage 1 LaMPs for critical pollutants for Lake Superior by 1995, Lake Ontario by 1995, and for Lake Erie by 1998 for consideration by the IJC.

Develop Stage 2 LaMPs for critical pollutants for Lake Superior by 1996, Lake Ontario by 1997, and for Lake Erie by 2000 for consideration by the IJC.

LaMPs are well under way for three of the four Canadian Great Lakes. The Stage 1 Problem Definition has been completed for Lakes Superior and Ontario; the Lake Erie Stage 1 document is expected in 1998. The Stage 2 Load Reductions and Ecosystem Targets document has been drafted for Lake Superior and public comments have been received. The Stage 2 document for Lake Ontario is delayed until winter 1999. Principles, objectives and indicators for Lake Huron are not due until 2000 and discussions have not been initiated.

3.2 HABITAT CONSERVATION AND PROTECTED AREAS

COA Target 3.2.1: Implement the Great Lakes Wetlands Conservation Action Plan (GLWCAP) in 1994 to protect coastal and basin wetlands.

Implementation of the GLWCAP is well under way with much progress in protecting and communicating the value of wetlands. More than 3 000 hectares at 14 wetlands have been secured, with the Eastern Habitat Joint Venture of the North American Waterfowl Management Plan a major partner.

COA Target 3.2.2: Apply the principles of the Federal Policy for the Management of Fish Habitat with a goal of net gain in productive capacity of fish habitat basin wide.

Fish habitat was addressed in the *Provincial Policy Statement* issued by the Government of Ontario in 1996. Implementation guidelines and manuals have been prepared to ensure that the principles of the *Federal Policy* are met. Recently, the provincial government withdrew from administering Section 35 requirements of the *Fisheries Act* that relate to the harmful alteration, disruption, or destruction of fish habitat. In future, the Department of Fisheries and Oceans Canada (DFO) alone will assess developments to determine their potential to impact fish habitat.

COA Target 3.2.3: Secure a network of protected areas representative of terrestrial and aquatic natural areas in the Great Lakes basin by 1999.

Significant progress towards meeting this target has occurred, with almost half a million additional hectares protected since 1995. The Great Lakes network continues to expand as priorities are brought forward and land is secured.

3.3 FISH AND WILDLIFE CONSERVATION

COA Target 3.3.1: Have biodiversity policies in place by 1996 designed to protect the function and structure of diverse, self-sustaining biological communities.

This target was achieved through the promulgation of the *Canadian Biodiversity Strategy: Canada's Response to the Convention on Biological Diversity*. Continuing activity under many COA targets contributes to the conservation of biodiversity.

COA Target 3.3.2: Focus monitoring programs to measure success in achieving healthy diverse ecosystems.

The Lake Superior Binational Program is developing a monitoring strategy to support its *Ecosystem Principles and Objectives, and Indicators and Targets for Lake Superior*. In addition, DFO and EC are developing a streamlined long-term monitoring plan for Lake Ontario. A similar monitoring plan is being developed for Lake Erie.

MNR continues to monitor production and other parameters in fish stocks in each Great Lake, and to develop management actions that include setting annual quotas for the commercial fishery.

COA Target 3.3.3: Develop and implement by 1997, joint federal and provincial action plans to control the introduction of undesirable species and mitigate the negative impacts of non-indigenous nuisance species such as zebra mussels and ruffe. The federal government will continue the control program on sea lamprey.

The federal and provincial governments continue to develop control programs in an effort to meet this target. Lake trout restoration in Lake Superior has been declared a success because of efforts to reduce lake trout mortality through sea lamprey control and restrictions on harvest and stocking. A number of other prevention programs are being developed, such as ballast water treatment to prevent accidental introductions, and risk assessment protocols to properly assess the risk of purposeful introductions. In addition, there are several programs in place to control (but not eradicate) invading species already present in the Great Lakes. The University of Guelph's experimental biological control program for purple loosestrife is a good example, as is the partnership between MNR and the Ontario Federation of Anglers and Hunters in an effort to prevent the spread of mussels to inland lakes through a boat cleaning program.

3.4 HUMAN HEALTH

COA Target 3.4.1: Protect and promote human health through education, long term monitoring and stewardship. By 2000, 70 per cent of the population will be knowledgeable about five key environmental health issues and how to reduce their risk.

By 2000, achieve for the general population a 30 per cent reduction in human health risks associated with exposure to environmental contaminants.

By 2000, 80 per cent of the population will have significantly increased their understanding and taken action in order to protect their health through involvement in environmental stewardship.

A wide variety of initiatives have been undertaken by Health Canada in response to this target. These include: developing human health indicators, supporting community education projects in rural and urban areas, and raising knowledge about environmental health through publications, conferences and media coverage.

3.5 CLIMATE CHANGE

COA Target 3.5.1: Identify the most likely impacts of climate variability and change on the Great Lakes Basin Ecosystem (for example, on human or ecosystem health or water and land use management) and develop and promote adaptive response strategies to reduce vulnerability.

A number of activities are being undertaken by EC and MNR to identify likely impacts of climate change. These include: research, development of database programs and tracking systems, assessments and inventories. A Toronto-Niagara Region study has been initiated to assess the likely impacts of climate change on urban areas.

3.6 LAND AND WATER USE MANAGEMENT

COA Target 3.6.1: Implement water efficiency initiatives to reduce per capita water use in the Great Lakes basin.

There are now numerous water efficiency success stories in Ontario, many of which were started with seed money provided by the Ontario Green Communities Initiative. EC and the Canadian Water and Wastewater Association are currently developing a web site to document these success stories. In addition, the Canada-Ontario Infrastructure Works program has been extended to the year 1997-98.

COA Target 3.6.2: Develop and adopt an ecosystem-based planning process to integrate land use and water management by 1997.

In 1997, provincial ministries and the associations of municipalities and conservation authorities evaluated the implementation and use of the concepts of watershed management. Recommendations included the need to produce a lay person's guide to watershed management, the ongoing responsibility for agencies to keep information current and accessible, and the commitment for regular training and science-transfer sessions for watershed managers.

COA Target 3.6.3: Focus demonstration projects for ecosystem-based practices to reduce stresses to land, water and biota.

Many demonstration projects have been initiated to date in support of this target. For example, through the Canada-Ontario Agriculture Green Plan, approximately 40 Rural Conservation Clubs, composed of Ontario farmers and other rural residents, received federal funding on a 50/50 basis to promote the exchange and evaluation of ideas on environmentally sustainable agricultural practices.

COA Target 3.6.4: Support the development and implementation of Environmental Farm Plans.

Since the fall of 1992, more than 10 000 farmers have attended workshops, with 5 186 approved integrated action plans in place. It is worth noting that individual farmers' contributions to these same projects (cash, labour, equipment, etc.) triple the value of the projects.

APPENDIX I:

SELECTED PUBLICATIONS ON GREAT LAKES ACTIVITIES

An Evaluation of Watershed Management in Ontario; Final Report 1997. (Watershed Implementation Project Committee, Ontario Ministries, Association of Municipalities of Ontario, and Association of Conservation Authorities of Ontario, 1997)

A State of Knowledge Report on Environmental Contaminants and Human Health in the Great Lakes Basin (Health Canada, 1997)

Canada-Ontario Agreement Objective 2.1: Priority Pesticides Confirmation of No Production, Use, or Import in the Commercial Sector in Ontario (Governments of Canada and Ontario, October 1996)

Canada-Ontario Agreement respecting the Great Lakes Basin Ecosystem (Governments of Canada and Ontario, July 1994).

Chemical Contaminants in Canadian Aquatic Ecosystems: An Assessment of their Effects on Fish, Fish Habitat and Fisheries Resources (Department of Fisheries and Oceans, available winter 1997)

Ecosystem Principles and Objectives, Indicators and Targets for Lake Superior (Lake Superior Binational Program, September 1996)

Fact Sheet: Pesticides Use Survey, Ontario's Vendors and Growers Certification program (Governments of Canada and Ontario, October 1996)

Great Lakes 2000 Cleanup Fund – Fish and Wildlife Habitat Newsletter.

Great Lakes 2000 Cleanup Fund – Project Highlights of the Fish and Wildlife Habitat Rehabilitation Program (Environment Canada, January 1995)

Great Lakes Fact Sheets (Environment Canada):

Amphibians and Reptiles in Great Lakes
Wetlands: Threats and Conservation (1996)

Contaminants in Herring Gull Eggs from the Great Lakes: 25 Years of Monitoring Levels and Effects (1997)

The Terns of the Canadian Great Lakes (1997)

Great Lakes Wetlands Conservation Action Plan 1994-2000, First Progress Report (October 1997)

Guidelines for Collecting Baseline Aquatic Habitat Data in the Great Lakes Areas of Concern (Environment Canada, 1995)

Rehabilitating Great Lakes Habitats – A Resource Manual (Environment Canada, 1995)

Rehabilitating Great Lakes Habitats – A Resource Manual (Environment Canada, 2 Volumes, 1995 and regular updates)

Remedial Action Plan Update (Governments of Canada and Ontario, October 1997), accessible at “www.cciw.ca/glimr/raps/intro.html”.

Summary Reports (Health Canada):

Sport Fish Eating and Your Health: A summary of The Great Lakes Anglers Exposure Study (April 1995)

Great Lakes Water and Your Health: A summary of “Great Lakes Basin Cancer Risk Assessment: A Case-Control Study of Cancers of the Bladder, Colon and Rectum.” (December 1995)

Outdoor Air and Your Health: A summary of Research Related to the Health Effects of Outdoor Air Pollution in the Great Lakes Basin (March 1996)

The Great Lakes – An Environmental Atlas and Resource Book (Government of Canada and the United States Environmental Protection Agency, 3rd edition, 1995).

The Great Lakes Binational Toxics Strategy: Canada-United States Strategy for the Virtual Elimination of Persistent Toxic Substances in the Great Lakes (April 1997).

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